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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/773,004

02/04/2004

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42P17761

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03/31/2008

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EXAMINER

MCCRACKEN, DANIEL

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

03/31/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/773,004	<b>Applicant(s)</b> MONTGOMERY ET AL.	
	<b>Examiner</b> DANIEL C. MCCracken	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 28-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 28-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

Citation to the Specification will be in the following format (S. # : ¶) where # denotes the page number and ¶ denotes the paragraph number. Citation to patent literature will be in the form (Inventor # : LL) where # is the column number and LL is the line number. Citation to the pre-grant publication literature will be in the following format (Inventor # : ¶) where # denotes the page number and ¶ denotes the paragraph number.

### *Response to Arguments*

Applicant's arguments filed 2/22/2008 have been fully considered but they are not persuasive. With respect to all rejections under 35 USC 112, Applicants urge that computational software be equated with chemistry. The Examiner disagrees. Computers do not make nanotubes. Computers do not do chemistry.

Applicants state "It is Applicant's understanding that the Examiner's primary concern is the limited amount of discussion related to reagents, temperature, pressure, etc. when forming the "connector molecule" and bonding the 'connector molecule' with 'nanotube segments.'" Yes. That is a primary concern. The concern comes straight out of the language of the statute, which states

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, **TO MAKE AND USE THE SAME** and shall set forth the best mode contemplated by the inventor of carrying out his invention.

35 U.S.C. 112. (emphasis added). How do you make the molecule? The Examiner (who reads patents and journal articles on a daily basis related to carbon nanotubes) has yet to come across a reference that teaches making a nanotube from a computer. How do you do it? Can you type "make a nanotube with a connector molecule" and have it come out of the disc drive?

The declaration – apart from being an interested party (i.e. the inventor) – fails to address any of this. The fact that you can model something does not enable one to make it.

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Does HyperChem provide the skilled artisan with a reaction? If so, why wasn't this submitted? How did the declarant know what atoms to place where? How did the declarant know what to input into the computer? Is this based on *real* chemistry? Why choose sulfur, why not phosphorous? Or silicon? Or carbon for that matter? Furthermore, the declarant (a mechanical engineer) cannot be considered one of skill in the art. Skilled artisans in the nanotube synthesis art are chemists. (Richard Smalley - inventor in the reference cited against Applicants - won the Nobel Prize in chemistry in 1996 for his work with fullerenes.) In light of this, the declarant's professional opinion on the ability to synthesize the connector molecule is less than persuasive. It is interesting to note that the applicant has a degree in mechanical engineering- not chemical engineering. Making molecules is not the same things as putting up drywall. Concerning the availability of the computer program, purchasing something from someone else and using it in its intended manner does not make for a patentable process. What algorithms were used by the program? What equations were used? How were the coefficients for the equations chosen? Has applicant actually synthesized and characterized any compounds? If so, then how?

The references provide have absolutely no relevance accept to prove that HyperChem is used to model molecules. It is noted that none of the "Hyperchem" references discuss nanotubes. How can you make the connection between a "connector molecule" and the nanotube? Appendix B which discusses functionalization, only serves to prove the Examiner's point. Note how all of the references provided describe actual chemistry. Now, compare that to the specification. Note also how others "took pictures" (micrographs) of their nanotubes. Now, compare that to the hand drawn figures in the Specification.

Finally, it is noted that the declaration/response is incomplete. Applicants were asked to address how the nanotubes were connected, yet did not. How do you make what is shown in Fig. 4? The Examiner, for the third time, requests experimental evidence be submitted. The

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Examiner would welcome a demonstration of the technology should the Applicants care to demonstrate it. Such a demonstration would be highly probative and helpful.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-10 and 28-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The analysis from all previous office actions is expressly incorporated herein by reference. The newly filed Claims 28-31 restate limitations previously discussed, and as such no further discussion is believed to be necessary.

Claims 1-10 and 28-31 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The analysis from all previous office actions is expressly incorporated herein by reference. The newly filed Claims 28-31 restate limitations previously discussed, and as such no further discussion is believed to be necessary.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-2 and 6-10 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,970,425 B1 to Smalley.

With respect to Claims 1-2, and 28-31, Smalley discloses the opening of carbon nanotubes and connecting them to a connector molecule. (Smalley 13, 17-23). As to Claim 6, Smalley discloses a filtering process. (Smalley 16, 35 *et seq.*). As to Claims 7-10, Smalley discloses making a polymer matrix. (Smalley 3, 51-55). Statements of intended use (i.e. as a heat dissipation device) are not given patentable weight.

Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnsamuel article.

**The reference, submitted with the Declaration, teaches the existence of a computer program to speculate upon performing chemical reactions. Using this program to perform speculations on materials of interest to the purchaser is an obvious expedient, especially in view of the discussion of fullerenes on pg. 3213, and in view of the fact that this is the intended use of the program.**

***Conclusion***

How do you enable something without stating somewhere how it is made? The Examiner didn't make that rule; Congress did. The Examiner would be particularly interested in any authority from the Supreme Court or Court of Appeals for the Federal Circuit that says something can be enabled without actually having described how you make it. Until then, the

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Examiner will rely on the *In re Wands* analysis. Should applicant traverse the '112 rejections, then the experimental data is requested.

All amendments made in response to this Office Action must be accompanied by a pinpoint citation to the Specification (i.e. page and paragraph or line number) to indicate where Applicants are drawing their support.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel C. McCracken whose telephone number is (571) 272-6537. The examiner can normally be reached on Monday through Friday, 9 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel C. McCracken/

/Stuart Hendrickson/

Daniel C. McCracken  
Examiner, Art Unit 1793  
DCM

Stuart L. Hendrickson  
Primary Examiner